

Sub D5
(A) a first diamine wherein said first diamine has amine groups which are sterically or electrically hindered; and,

(B) a second diamine having no interference with its amine group, wherein said first diamine has greater hindrance of its amine group than said second diamine's amine group.

45 The golf ball according to claim 44 wherein said first diamine is dimethylthio-2,4-toluenediamine.

46 The golf ball according to either claim 44 or 45 wherein said second diamine is diethyl-2,4-toluenediamine.

47 The golf ball according to claim 46 wherein the polyol is selected from the group consisting of ether glycol, polytetramethyl glycol and mixtures thereof.

REMARKS

Applicant appreciates the Examiner's review of the present application and respectfully requests reconsideration in light of the following remarks.

Status of the Claims

Claims 30-33 and 36-43 are pending in the present application.

Claims 30-33 and 36-43 of the application currently stand rejected. The respondent respectfully traverses the rejection and asks that the claims be allowed based upon the arguments supplied below.

Claims

Claims 30, 33 and 43 have been amended for purposes of clarification. Claim 30 has been amended to distinctly point out a diamine curative as fully supported by the specification. Additionally enclosed declaration by George Wallace supports the superiority and novelty of amended claim 30.

New claims 44-47 have been added which are fully supported by the specification. The support for new claim 44 can be found in the specification on page 10, line 11 which describes the structure of slow reacting sterically hindered polyamine curing agents and unhindered polyamine curing agents which are found in the new claims. The new claims are fully supported in view of §112(1) and (2) and do not incorporate new matter. Furthermore they describe structures which are fully supported by the specification and therefore not indefinite.

Rejection of the claims under 35 U.S.C. § 112 (1)

The Office contends that claims 30-33 and 36-39 contain subject matter not described in a way as to reasonably convey to one skilled in the art that the inventors had possession of the invention claimed. The Office contends that clear

support is not provided for the reaction rates of respective diamines' reaction rates at room temperature.

The applicant respectfully traverses the rejection and contends the specification as written fully supports the claimed diamine rates. The applicant has amended claim 30 to incorporate specific diamine curative agents which are fully supported by the specification and removed reference to reaction rates. Therefore the amendment makes the rejection now moot. New claim 44-47 addresses the reaction rates of the diamines in terms of their structures. Applicant contends that the specification is fully supported by the definition of the description of faster and slower rates of diamine curatives because it is descriptive of the inventive concept of combining diamines with differing rates to achieve controllable processing with room temperature cure.

Rejection of the claims under 35 U.S.C. § 112 (2)

In the office action dated April 20, 2000 the Office rejected claim 43 under 35 U.S.C. § 112 (2), as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The applicant traverses the Office's contention and asks respectfully requests reconsideration and allowance of claim 43 as currently drafted.

The Office contends that the applicant's claim 43 is indefinite with respect to the NCO content for the diisocyanate components. The Office contends that the prepolymer NCO content applies to prepolymers in the specification at page 26, line

9. The Office is correct in that the NCO content applies to prepolymers. The Office should take note of the following passage of the specification page 26, line 9 which is presented below:

*“Systems using TDI , IPDI (Isophorone diisocyanate) or MDI as the diisocyanate and an ether backbone are **all choices** for the polyurethane prepolymer.”*

The NCO weight of 6% clearly applies to TDI and PTMEG combined, which is listed as a polyurethane prepolymer. In the specification a prepolymer is a chemical which when combined with a second chemical forms polyurethane. TDI is listed as a candidate for use as a prepolymer, thus there is no confusion nor ambiguity about the NCO content. Reconsideration and allowance is requested for claim 43 which is fully supported by the specification.

The claim is further supported by the specification on page 24, line 16-17 that states: “(low free TDI @ 6% NCO content and PTMEG)”. This quote from the specification further supports claim 43 as drafted. Please reconsider the rejection of claim 43 as drafted as it is clearly supported. Claim 43 has been amended to increase the clarity of the claim to better reflect the applicant’s invention and not to respond to the rejection of the Office.

Rejection of the claims under 35 U.S.C. § 103 (a)

In the communication the Office has rejected claims 30-33 and 36-43 under 35 U.S.C. 103(a) as being unpatentable over Kato (U.S. PAT. 5,704,852) or GB 2301291, each in view of Wu (U.S. PAT. 5,334,673), Isaac (U.S. PAT. 3,989,568) and

Presswood (U.S. PAT. 4,631,298). A discussion of the relation of the present invention to the prior art cited follows.

The teachings of the Instant Invention

The instant invention involves a golf ball with a solid rubber core that may be wound. The solid core may be of a large diameter that was thought unachievable in the prior art due to problems with material durability. The polyurethane cover was previously not favored in high production batches because of many processing deficiencies.

The polyurethane cover of the instant invention addresses the processing problems of using and processing the polyurethane components. The use of the diamine curative blend allows for the processing of the polyurethane in a controlled manner without undesirable extra operations or controls such as the extra step of forming slabs to control the reaction rate. Furthermore the room temperature curing of the polyurethane allows for the use of a wound core without the threat of thread relaxation that occurs in other less desirable high heat curing systems.

The combination of the instant invention's choice of diisocyanate, polyol and diamine curative blend is what makes the instant invention such a breakthrough in polyurethane chemistry as applied to the golf ball art. Only through the claimed specific combination of all three components is the desired ease of processibility at room temperature cure achieved. George Wallace's enclosed declaration particularly points out the benefits of the instant invention as embodied in amended claim 30. Previous attempts at golf ball manufacture with polyurethane's was a

labor intensive task which was very hard to repeat with accuracy because of the nature of the previous reactants used. Others in the industry have failed to produce a golf ball with similar properties and ease of processing as with that of the instant invention.

There has been a long felt need in the golf ball industry to process a golf ball at a low temperature without a high heat cure that was absent until the instant invention. While other's produced golf balls with polyurethane covers they were very labor intensive and hard to manufacture at a large scale until the instant invention.

The Teachings of the Kato '852 Patent

The Kato '852 patent discloses a rubber core that is sulfur vulcanized, containing fillers, accelerants and curing agents, and further a layer of rubber thread windings. The Office fails to point out that the Kato disclosure does not disclose a core of similar size to that of the instant invention. The Office is mistaken in the combination of the Kato '852 reference with the other cited references either alone or in combination to specifically claims 38 and 40-43 because the Kato reference specifically teaches away from the use of that specific core above a diameter of 35mm.

The Kato '852 reference specifically teaches away from the use of a core larger than 35mm in its disclosure. Kato teaches in column 2, line 44-48:

"On the other hand, when the diameter of the center is larger than 35mm, the thread rubber layer becomes thin and the thread rubber has already been wound before the tension is formed so that a suitable hardness as the golf ball can not be obtained"

Therefore it is improper to use the core disclosed in Kato under 35 U.S.C. 103(a) in combination with any disclosure which suggests the desirability of a larger core.

With respect to the use of the combination of the Kato core without regard to the core size the Office states that the cited disclosure is silent to any motivation to add a polyurethane cover or any related polyurethane chemistry. Thus Kato teaches away from the production of a golf ball with a larger core and is silent regarding a polyurethane cover.

The Federal Circuit has stated that “[t]he test for obviousness is not whether the features of one reference may be bodily incorporated into another reference. . . . Rather, we look to see whether combined teachings render the claimed subject matter obvious.” See In re Wood, 599 F.2d 1032, 202 USPQ 171, 174 (C.C.P.A. 1979)(emphasis added) (citing In re Bozek, 416 F.2d 1385, 1390, 163 USPQ 545, 549-50 (C.C.P.A. 1969))

Therefore it would be improper to use Kato in combination with any reference in forming a prima facie case of obviousness against the instant invention without greater motivation to combine the elements.

The Teachings of the GB 2301291A disclosure

Furthermore the GB 2301291A (hereafter GB) disclosure is similar to the Kato disclosure in that it specifically teaches away from the use of a wound core greater in diameter than 38mm (1.49 inches). The following quote taken from the

GB disclosure page 5, lines 6-13 illustrates that the disclosure teaches away from the present invention:

“When the outer diameter exceeds 38 mm, sufficient amount of a rubber thread cannot be wound on the solid center. In this case, unless the solid center is made remarkably hard or the elongation rate of the rubber thread is remarkably high, a resulting golf ball with reasonable hardness cannot be obtained. Even if the reasonable hardness is obtained this way, the resulting golf ball may have poor durability and unsatisfactory feel on impact. The solid center may preferably have an outer diameter of from 28 to 35 mm, more preferably from 30 to 33 mm.”

Thus it is improper to cite the GB disclosure against claims 40-42 which specifically claim a core diameter that is as large as 42 mm because the GB disclosure specifically teaches away from the use of a core greater than 38 mm in diameter. With regard to the remaining claims the Office correctly noted that the GB disclosure is silent with regard to the use or suggested desirability of a polyurethane cover. Thus the same considerations that should remove the Kato disclosure as an obviousness reference should also apply to the GB disclosure.

The Teachings of the Wu '673 Patent

The Office contends that Wu discloses the use of prepolymers based on diisocyanates and polytetramethylene ether glycol and a slow reacting polyamine, such as 3,5-dimethylthio toluene diamine. The applicant responds to the Office's use of the Wu disclosure as inappropriate because there is no motivation to combine 3,5-dimethylthio toluene diamine with another diamine of a different reaction rate

provided in the disclosure without improperly using hindsight or the applicant's disclosure.

The Wu disclosure incorporated the '568 patent to Issac in its background which stated that the curative must have a combination of different rates of reaction of fast reacting diamines. The Wu patent disregarded the teachings of combining fast reacting diamines and used only a slow reacting diamine curative. Thus one skilled in the art would not be motivated by the Wu disclosure to combine its disclosed polyurethane system which presents the idea of combining diamine curatives and then specifically disregards that teaching.

Therefore the Wu disclosure should not be used in combination with other curatives to provide the instant invention because Wu disclosed and discounted the idea presented of combining diamine curative systems. Thus the Wu disclosure should not be used against the instant invention either alone or in combination with other disclosures which suggest the use of combining curatives because it is the equivalence of teaching away from a combination of references when a teaching is disclosed and then ignored.

The Teachings of the Isaac '568 Patent

The Office contends that the Isaac patent discloses the use of blends of curative agents having different reactivities that permit a center to be introduced into a semi-cured golf ball cover half which is then mated with the other half and then cured. The Office then further contends that the use of polyurethanes having

controlled reaction profiles and improved properties was known at the time of filing. The applicant respectfully traverses the Office's use of the Isaac disclosure against the instant invention.

The fact that there were controllable reactions of polyurethane cover formulations for golf balls in existence does not bear weight in the 103-obviousness calculation. The Isaac disclosure discusses wide ranges of processibility and curing but is only in possession of the polyurethane formulations which need high cure temperatures from 180°-310°F as explained in example 1 and compression molded at 240°F for example 2. The Isaac disclosure states that the balls may be post cured at ambient temperature for two weeks but this is a second cure after the ball already had endured a previous high temperature cure. The disclosure fails to provide specific examples other than a secondary post cure phase.

The Isaac disclosure is only an invitation to experiment with reactivities but it provides no motivation to solve the polyurethane processing problems conquered by the instant invention. It does not state that it is a desirable goal to achieve the performance of the instant application. Nor is the instant invention achievable from this disclosure without undergoing undue experimentation with thousands of potential reactants to achieve the instant invention.

The polyurethane cover formulation lacks a critical benefit that the instant application provides, room temperature post curing with a curative agent which is easily processable. The Isaac disclosure presents no motivation or desire to use other formulations that would allow for the processing without the need for the use

of slabs. Furthermore the Isaac disclosure only provides the polyurethane formulation of mixtures which are first formed into sheets and then compression molded, which is completely different then the instant application which has the mixture directly placed into the mold halves reducing several unnecessary and undesirable processing steps involving sheet production.

Therefore the Isaac disclosure provides no motivation to use the specific diamine curatives as stated by the Office. Furthermore the Isaac disclosure provides no motivation for the use of a polyurethane formulation which is processed without the use of slabs. Therefore the ease of processing of the instant invention is lacking from the Isaac disclosure and thus it should not be combined to form an obvious rejection.

The Teachings of the Presswood '298 Patent

The Office contends that the aforementioned disclosures in combination with the Presswood '298 disclosure render the instant invention obvious. The applicant contends that the Presswood '298 disclosure does not provide the necessary motivation to combine its teachings with that of the other references provided by the Office. Furthermore the teachings of the Presswood '298 disclosure are incompatible with the other cited references.

The Presswood '298 disclosure teaches the use of polyurethanes used in the RIM process which one could argue is a non-analogous art. Even with the argument that it involves similar chemistry and attempts to solve similar problems

it would not be a disclosure which would motivate one to combine the Presswood disclosure with the earlier cited references.

The teachings of the Presswood '298 disclosure, columns 2-4 as suggested by the Office, use a prepolymer with a stoichiometric excess of diisocyanate wherein the instant invention uses nearly a perfect stoichiometric balance. The Presswood disclosure requires the use of a catalyst and expensive and precise controls wherein the instant invention does not use a catalyst to control the reaction.

Furthermore where the Presswood disclosure contains some basic similar polyurethane chemistry it does not disclose nor motivate one to produce either alone or in combination the polyurethane chemistry of the instant invention which solves the polyurethane processing problems that are unique to the cast molding of golf balls which contain tiny dimples and potentially heat sensitive fragile cores that must be precisely positioned in the center of the mold.

The Presswood disclosure solves the problems associated with filling an extremely large part such as an automobile bumper facia which is potentially thousands of times larger in surface area than the instant invention and then demolding that extremely large part with sufficient green strength. The RIM process of the Presswood disclosure would not motivate one skilled in the art of golf ball production to modify their polyurethane chemistry in a similar fashion without undue experimentation.

Conclusion

The Office cites a combination of four disclosures which provides no motivation to produce the instant invention. The Kato and GB disclosures are silent with regard to the use of a polyurethane cover as stated by the Office. The Office cites Wu which discloses the use of prepolymers but Wu rejects the use of a combination of diamine curatives when it discloses fast diamines yet teaches the use of only slow reacting diamines. Thus Wu teaches against the combination of fast and slow reacting diamines and should not be cited in combination with other art to make a 103 rejection against the instant invention.

The Office cited Isaac to introduce the element of blends of curing agents. The Isaac process involves the use of a catalyst in its system when using its blend of curatives and involves the intermediate step of forming a frozen slab to control the reaction of the polymer. One skilled in the art would not be motivated to choose the elements of the instant invention to avoid that additional processing step if they truly relied upon the teachings of Isaac.

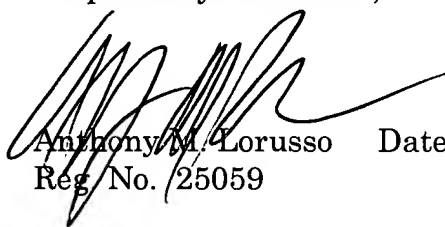
Finally the Office combines Presswood, which discloses the production of articles akin to urethane automobile bumpers using the RIM process listing hundreds of reactant choices disclosed only because of the stated goal of extended gel time, with cited golf ball art. The cited combinations of the Office would not lead to the instant invention.

The enclosed declaration from George Wallace states that the ball is superior because of its properties from the specific combination of elements. The

combination of elements would not be chosen from the art cited without improper use of hindsight and ignoring the teaching of the cited art. None of the cited art disclose the use of the combined elements of the instant invention without the use of catalysts. Mr. Wallace states the problems associated with catalysts and the superiority of the instant invention over that of the cited art and current golf balls with polyurethane covers produced today.

In light of the prior art all claims as written and now amended in the instant invention are allowable. Reconsideration and allowance are requested.

Respectfully submitted,

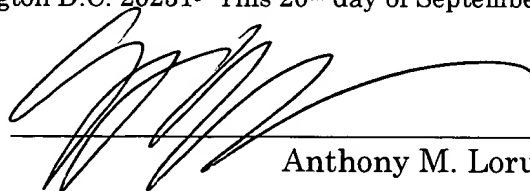


Anthony M. Lorusso Dated: 20 SEP 2000
Reg. No. 25059

440 Commercial Street
Boston, MA 02109
Tel.: (617) 227-0700
FAX: (617) 723-4609

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Anthony M. Lorusso